

# LMK 487



## Probe for Marine and Offshore 22 mm

Ceramic Sensor

accuracy according to IEC 60770:  
0.25 % FSO

### Nominal pressure

from 0 ... 1 mH<sub>2</sub>O up to 0 ... 100 mH<sub>2</sub>O

### Output signals

2-wire: 4 ... 20 mA  
others on request

### Special characteristics

- ▶ diameter 22 mm
- ▶ LR-certificate (Lloyd's Register)
- ▶ DNV•GL Approval (Det Norske Veritas • Germanischer Lloyd)
- ▶ diaphragm 99.9 % Al<sub>2</sub>O<sub>3</sub>
- ▶ high long-term stability

### Optional versions

- ▶ housing material titanium
- ▶ IS-version  
Ex ia = intrinsically safe for gas and dust
- ▶ temperature element Pt 100
- ▶ different kinds of elastomer

The hydrostatic probe LMK 487 has been developed for measuring levels in various tank applications for shipbuilding and offshore. In comparison to the hydrostatic probe LMK 458 the external diameter amounts to only 22 mm by which the installation in 1" pipes can be carried out easily.

Beside the housing materials stainless steel and titanium, different elastomer materials are available by which an optimum adaptation to the application can be ensured.

### Preferred areas of use



#### Water

drinking water abstraction  
desalinization plant

#### Shipbuilding / Offshore

ballast tanks



monitoring of a ship's  
position and draught  
level measurement in ballast  
and storage tanks



Input pressure range														
Nominal pressure gauge	[bar]	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10		
Level	[mH <sub>2</sub> O]	1	1.6	2.5	4	6	10	16	25	40	60	100		
Overpressure	[bar]	3	4	5	5	7	7	12	20	20	20	20		
Burst pressure ≥	[bar]	4	6	8	8	9	9	18	25	25	30	30		
Permissible vacuum	[bar]	-0.2	-0.3			-0.5					-1			
Max. ambient pressure (housing): 40 bar														
Output signal / Supply														
Standard	2-wire: 4 ... 20 mA / V <sub>S</sub> = 12 ... 36 V <sub>DC</sub>													
Option IS-version	2-wire: 4 ... 20 mA / V <sub>S</sub> = 14 ... 28 V <sub>DC</sub>													
Option Pt 100-temperature element														
Temperature range	-25 ... 125 °C													
Connectivity technology	3-wire													
Resistance	100 Ω at 0 °C													
Temperature coefficient	3850 ppm/K													
Supply I <sub>S</sub>	0.3 ... 1.0 mA <sub>DC</sub>													
			max. voltage 10 V <sub>DC</sub> ,			max. current 2 mA,			max. power 10 mW,			in intrinsically safe circuit 30 V <sub>DC</sub> in intrinsically safe circuit 54 mA in intrinsically safe circuit 405 mW		
Performance														
Accuracy <sup>1</sup>	nominal pressure ≥ 0.4 bar: ≤ ± 0.25 % FSO						nominal pressure < 0.4 bar ≤ ± 0.35 % FSO							
Permissible load	R <sub>max</sub> = [(V <sub>S</sub> - V <sub>Smin</sub> ) / 0.02 A] Ω													
Influence effects	supply: 0.05 % FSO / 10 V						load: 0.05 % FSO / kΩ							
Long term stability	≤ ± 0.1 % FSO / year													
Turn-on time	450 msec													
Mean response time	≤ 70 msec													
Measuring rate	80 Hz													
<sup>1</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)														
Thermal effects (offset and span)														
Tolerance band	≤ ± 1 % FSO						in compensated range -20 ... 80 °C							
Permissible temperatures														
Permissible temperatures	medium / storage: -25 ... 85 °C													
Electrical protection <sup>2</sup>														
Short-circuit protection	permanent													
Reverse polarity protection	no damage, but also no function													
Electromagnetic compatibility	emission and immunity according to - EN 61326 - DNV•GL (Det Norske Veritas • Germanischer Lloyd)													
<sup>2</sup> additional external overvoltage protection unit in terminal box KL 1 or KL 2 with atmospheric pressure reference available on request														
Mechanical stability														
Vibration	4 g (according to DNV•GL: Class B, curve 2 / basis: IEC 60068-2-6)													
Electrical connection														
Cable with sheath material <sup>3</sup>	TPE-U (-25 ... 125 °C) blue Ø 7.4 mm TPE-U <sup>4</sup> (-25 ... 125 °C) red Ø 9.0 mm													
Bending radius	static installation: 10-fold cable diameter						dynamic application: 20-fold cable diameter							
<sup>3</sup> shielded cable with integrated ventilation tube for atmospheric pressure reference (for nominal pressure ranges absolute, the ventilation tube is closed)														
<sup>4</sup> only in combination with IS version (explosion protection) and temperature element Pt100														
Materials (media wetted)														
Housing	standard: stainless steel 1.4404 (316 L) option: titanium (resistant against sea water) others on request													
Seals (O-rings)	standard: FKM options: EPDM; FFKM (min. permissible temperature from -15 °C) others on request													
Diaphragm	ceramics Al <sub>2</sub> O <sub>3</sub> 99.9%													
Protection cap	POM-C													
Cable sheath	TPE-U (flame-resistant, halogen free, increased resistance against oil and gasoline, resistant against salt, sea water, heavy oil)													
Category of the environment														
Lloyd's Register (LR)	number of certificate: 18/20068						ENV1, ENV2, ENV3, ENV4							
Det Norske Veritas/ Germanischer Lloyd (DNV GL)	number of certificate: TAA00000RM						temperature: D humidity: B vibration: B EMC: B enclosure: D							
Explosion protection														
Approval DX14B-LMK 487	IBExU 15 ATEX 1066 X / IECEx IBE 18.0019X zone 0: II 1G Ex ia IIB T4 Ga zone 20: II 1D Ex ia IIIC T135 °C Da													
Safety technical maximum values (pressure)	U <sub>i</sub> = 28 V, I <sub>i</sub> = 93 mA, P <sub>i</sub> = 660 mW, C <sub>i</sub> = 49.2 nF, L <sub>i</sub> = 0 µH; the supply connections have an inner capacity of max. 100 nF opposite the enclosure													
Safety technical maximum values (temperature)	U <sub>i</sub> = 30 V, I <sub>i</sub> = 54 mA, P <sub>i</sub> = 405 mW, C <sub>i</sub> = 0 nF, L <sub>i</sub> = 0 µH (temperature element Pt 100)													
Permissible temperatures for environment	in zone 0: -20 ... 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar zone 1 and higher: -25 ... 65 °C													
Connecting cables (by factory)	cable capacity: signal line/shield as well as signal line/signal line: 160 pF/m cable inductance: signal line/shield as well as signal line/signal line: 1 µH/m													

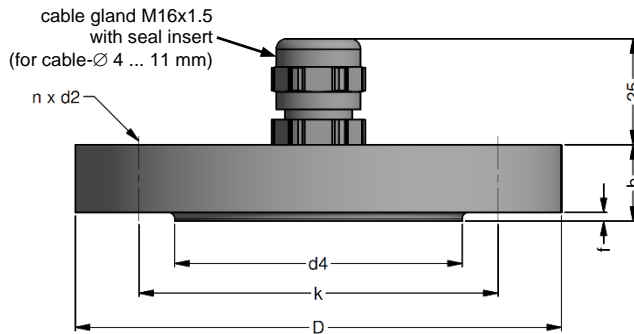
# LMK 487

Probe for Marine and Offshore

Technical Data

Miscellaneous	
Current consumption	max. 22 mA
Weight	approx. 180 g (without cable)
Ingress protection	IP 68
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU
Pin configuration	
Electrical connection	cable colours (IEC 60757)
Supply + Supply -	WH (white) BN (brown)
Option Pt 100 temperature element: Supply T+ Supply T- Supply T-	YE (yellow) GY (grey) PK (pink)
Shield	GYNE (green-yellow)
Wiring diagrams	
<p>2-wire-system (current)</p>	<p>2-wire-system (pressure) / 3-wire-system (temperature)</p>
Dimensions (mm / in)	
<p><b>standard</b></p>	<p><b>option: screw-in version</b></p>
<p>protection cap removable</p>	
<p>G3/4" flush</p>	
<p>⇒ cable diameter Ø9 mm for TPE-U cable (red), drawings for option with Pt 100 on request</p>	

## Mounting flange with cable gland



dimensions in mm			
size	DN25 / PN40	DN50 / PN40	DN80 / PN16
b	18	20	20
D	115	165	200
d2	14	18	18
d4	68	102	138
f	2	3	3
k	85	125	160
n	4	4	8

Technical data		
Suitable for	all probes	
Flange material	stainless steel 1.4404 (316L)	
Material of cable gland	standard: brass, nickel plated on request: stainless steel 1.4305 (303); plastic	
Seal insert	material: TPE (ingress protection IP 68)	
Hole pattern	according to DIN 2507	
Ordering type	Ordering code	Weight
DN25 / PN40 with cable gland brass, nickel plated	ZMF2540	1.4 kg
DN50 / PN40 with cable gland brass, nickel plated	ZMF5040	3.2 kg
DN80 / PN16 with cable gland brass, nickel plated	ZMF8016	4.8 kg

## Terminal clamp



Technical data		
Suitable for	all probes with cable Ø 5.5 ... 10.5 mm	
Material of housing	standard: steel, zinc plated optionally: stainless steel 1.4301 (304)	
Material of clamping jaws and positioning clips	PA (fibre-glass reinforced)	
Dimensions (mm)	174 x 45 x 32	
Hook diameter	20 mm	
Ordering type	Ordering code	Weight
Terminal clamp, steel, zinc plated	Z100528	approx. 160 g
Terminal clamp, stainless steel 1.4301 (304)	Z100527	

## Display program

- CIT 200** Process display with LED display
- CIT 250** Process display with LED display and contacts
- CIT 300** Process display with LED display, contacts and analogue output
- CIT 350** Process display with LED display, bargraph, contacts and analogue output
- CIT 400** Process display with LED display, contacts, analogue output and Ex-approval
- CIT 600** Multichannel process display with graphics-capable LC display
- CIT 650** Multichannel process display with graphics-capable LC display and datalogger
- CIT 700 / CIT 750** Multichannel process display with graphics-capable TFT monitor, touchscreen and contacts
- PA 440** Field display with 4-digit LC display

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## Ordering code LMK 487

LMK 487

□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
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<b>Pressure</b>																	
gauge in bar		3	6	5													
gauge in mH <sub>2</sub> O		3	6	6													
<b>Input</b>																	
	[mH <sub>2</sub> O]	[bar]															
	1.0	0.10	1	0	0	0											
	1.6	0.16	1	6	0	0											
	2.5	0.25	2	5	0	0											
	4.0	0.40	4	0	0	0											
	6.0	0.60	6	0	0	0											
	10	1.0	1	0	0	1											
	16	1.6	1	6	0	1											
	25	2.5	2	5	0	1											
	40	4.0	4	0	0	1											
	60	6.0	6	0	0	1											
	100	10	1	0	0	2											
	customer		9	9	9	9										consult	
<b>Housing</b>																	
stainless steel 1.4404 (316L)																	1
titanium																	T
customer																	9
<b>Design</b>																	
probe																	1
screw-in version G3/4" flush																	B
<b>Diaphragm</b>																	
ceramics Al <sub>2</sub> O <sub>3</sub> 99,9 %																	C
customer																	9
<b>Output</b>																	
4 ... 20 mA / 2-wire																	1
intrinsic safety 4 ... 20 mA / 2-wire																	E
customer																	9
<b>Seals</b>																	
FKM																	1
EPDM																	3
FFKM <sup>1</sup>																	7
customer																	9
<b>Electrical connection</b>																	
TPE-U-cable (blue, Ø 7.4 mm) <sup>2</sup>																	4
TPE-U-cable (red, Ø 9.0 mm) <sup>2,3</sup>																	42
<b>Accuracy</b>																	
standard for p <sub>N</sub> < 0,4 bar		0.35 % FSO															3
standard for p <sub>N</sub> ≥ 0,4 bar		0.25 % FSO															2
customer																	9
<b>Cable length</b>																	
in m																	9 9 9
<b>Special version</b>																	
standard																	0 0 0
with temperature sensor Pt 100																	0 1 3
customer																	9 9 9
																	consult

<sup>1</sup> min. permissible temperature from -15 °C

<sup>2</sup> shielded cable with integrated ventilation tube for atmospheric pressure reference

<sup>3</sup> only in combination with IS version (explosion protection) and temperature element Pt 100

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